APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/450,381	11/29/1999	RAJESH R. SHAH	219.37639X00	7550

7590   01/05/2005

Rob Anderson
C/O BLAKELY, SOFOLOFF, TAYLOR & ZAFMAN LLP
12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025

EXAMINER
ANYA, CHARLES E

ART UNIT	PAPER NUMBER
2126	

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/450,381	SHAH ET AL.
	Examiner	Art Unit	
	Charles E Anya	2126	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3/* MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *15 September 2004*.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-30* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-30* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *12/13/04*.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

1.   Claims 1-30 are pending in this application.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   **Claims 1,2,4,14,15,20 and 21 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over U.S. Pat. No. 5,644,712 to Coscarella et al. in view of U.S. Pat.

No. 6,341,356 B1 to Johnson et al.

4.   As to claim 1, Coscarella teaches a host coupled to a cluster fabric including one

or more fabric-attached I/O controllers, comprising: a processor, a memory coupled to

the processor and an operating system provided with an I/O bus abstraction to report

multiple paths to a target fabric-attached I/O controller (figures 1 and 3A/B Col. 5 Ln. 14

– 67, Col. 6 Ln. 1 - 49) and the operating system that directs service requests between

the host and the target fabric-attached I/O controller in response to the multiple paths

(figure 5 Col. 7 Ln. 24 - 63).

5.   Coscarella is silent with reference to one or more fabric-attached I/O controllers

that may be allocated or assigned to different hosts.

6.   Johnson teaches one or more fabric-attached I/O controllers that may be allocated or assigned to different hosts (Col. 2 Ln. 26 – 43).

7.   It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Johnson and Coscarella because the teaching of Johnson would improve the system of Coscarella by providing a path load balancing and fail over for a plurality of paths to a plurality of storage subsystems (Col. 2 Ln. 38 – 43).

8.   As to claim 2, Coscarella teaches the host as claimed in claim 1, wherein said operating system further comprises: a kernel, and a fabric bus driver to provide said I/O bus abstraction to the kernel for the cluster fabric to report the multiple paths to the target fabric-attached I/O controller (figure 5 (IOP 1 18) Col. 7 Ln. 24 - 63).

9.   As to claim 4, Coscarella teaches the host as claimed in claim 2, further comprising a host-fabric adapter provided to interface the host to the cluster fabric (figure 1 Col. 1 Ln. 21 - 67).

10.   As to claim 14, Coscarella teaches a cluster comprising: a cluster fabric, a host including an operating system coupled to the cluster fabric, an I/O controller attached to the cluster fabric (figures 1 Col. 5 Ln. 21 - 67), and a fabric manager coupled to the cluster fabric, for assigning I/O controllers in the cluster fabric to at least said host and sending messages to said host indicating that the I/O controller has been assigned

(figure 9 col. 13 Ln. 20 - 67, Col. 14 Ln. 1 - 14), wherein said operating system including

a fabric bus driver provided to report multiple paths to a target fabric-attached I/O

controller and the operating system to direct service requests between the host and the

target fabric-attached I/O controller in response to the response to the multiple paths

(figures 1 and 3A/B Col. 5 Ln. 14 - 67, Col. 6 Ln. 1 - 49, figure 5 Col. 7 Ln. 24 -

63).

11.   Coscarella is silent with reference to the I/O controller that may be allocated or

assigned to different hosts.

12.   Johnson teaches the I/O controller that may be allocated or assigned to different

hosts (Col. 2 Ln. 26 – 43).

13.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine the teachings of Johnson and Coscarella because the

teaching of Johnson would improve the system of Coscarella by providing a path load

balancing and fail over for a plurality of paths to a plurality of storage subsystems

(Johnson Col. 2 Ln. 38 – 43).

14.   As to claim 15, see the rejection of claim 2 above.

15.   As to claim 20, Coscarella teaches the cluster as claimed in claim 14, wherein

said fabric manager comprises: fabric services to detect the connection or presence of

the target fabric-attached I/O controller and to assign a network address to the target

fabric-attached I/O controller, and an I/O controller manager coupled to the fabric

services to assign the target fabric-attached I/O controller to said host and to send

messages to said host indicating that the target fabric-attached I/O controller has been

assigned (figure 9 Col. 13 Ln. 20 - 67).

16.   As to claim 21, see the rejection of claim 1 above.

17.   Claims 5-8,17-19 and 22-30 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Pat. No. 5,644,712 to Coscarella et al. in view of U.S. Pat.

No. 6,341,356 B1 to Johnson et al. as applied to claim 4 above, and further in view

of of U.S. Pat. No. 6,594,698 B1 to Chow et al.

18.   As to claim 5, Coscarella as modified in claim 4 is silent with reference to the

host as claimed in claim 4, further comprising a fabric adapter device driver provided to

control operation of the host-fabric adapter.

19.   Chow teaches the host as claimed in claim 4, further comprising a fabric adapter

device driver provided to control operation of the host-fabric adapter (Fibre Channel

Interface Low Level Driver 506 Col. 10 Ln. 39 - 67).

19. It would have been obvious to one of ordinary skill in the art at the time the invention

was made to combine the teachings of Chow, Johnson and Coscarella because the

teaching of Chow would improve the system of Johnson and Coscarella by providing a

means for determining the status of a host adapter (Chow reference Col. 10 Ln. 45 -

47).

20.   As to claim 6, Coscarella as modified in claim 5 is silent with reference to the

host as claimed in claim 5, wherein said fabric bus driver creates a separate device

object for each port of the host-fabric adapter that can be used to communicate with the

target fabric-attached I/O controller and establish the multiple paths to the target fabric-

attached I/O controller.

21. Chow teaches the host as claimed in claim 5, wherein said fabric bus driver creates

a separate device object for each port of the host-fabric adapter that can be used to

communicate with the target fabric-attached I/O controller and establish the multiple

paths to the target fabric-attached 1/0 controller ("...IOB..." Col. 10 Ln. 62 - 67,

21.   As to claim 7, Coscarella teaches the host as claimed in claim 5, wherein said

multiple paths are utilized for load balancing I/O requests and/or for fault tolerance

when one or more paths to the target fabric-attached I/O controller fail ("...busy..."

figure 5 Col. 8 Ln. 1 - 37).

22.   As claim 8, Coscarella as modified in claim 5 is silent with reference to the host

as claimed in claim 5, wherein said fabric bus driver creates a single device object for

the target fabric-attached I/O controller even if multiple pods of the host-fabric adapter

can be used to communicate with the target fabric-attached I/O controller.

23.   Chow teaches the host as claimed in claim 5, wherein said fabric bus driver

creates a single device object for the target fabric-attached I/O controller even if multiple

ports of the host-fabric adapter can be used to communicate with the target fabric-

attached I/O controller ("...IOB..." Col. 10 Ln. 62 - 67, Col. 1 1 Ln. 1 - 29).

24.   As to claims 17-19, see the rejection of claims 6-8 respectively.

25.   As to claim 22, Coscarella teaches a method of initializing a host to report

multiple paths to a target agent via a cluster fabric, comprising: enabling the local I/O

bus driver to identify any local I/O controllers connected to a corresponding local I/O

bus/enabling the fabric bus driver to identify any fabric-attached 1/0 controllers assigned

to the host, and report the identified local I/O controllers connected to the local I/O bus

and the identified fabric-attached I/O controllers to the I/O manager (figure 9 Col. 13 Ln.

20 - 67), enabling the fabric bus driver to create and report multiple paths to a target

fabric-attached I/O controller via the cluster fabric (figure 3NB Col. 5 Ln. 14 - 67) and

directing service requests between the host and the target fabric-attached I/O controller

in response to the multiple path (figure 5 Col. 7 Ln. 24 - 63).

26.   Coscarella and Johnson are silent with reference to loading an operating system

kernel into a memory, loading an I/O manager into the memory, loading a local I/O bus

driver and a fabric bus driver providing a local I/O bus abstraction for the cluster fabric

into the memory and loading an I/O controller driver into the memory for each reported

I/O controller. Also see the rejection of claim 1 above.

27.   Chow teaches loading an operating system kernel into a memory, loading an I/O

manager into the memory (Col. 6 Ln. 45 - 59), loading a local I/O bus driver and a fabric

bus driver providing a local I/O bus abstraction for the cluster fabric into the memory and loading an I/O controller driver into the memory for each reported I/O controller ("...cs..." Col. 6 Ln. 38 - 49, Col. 9 Ln. 10 - 18, Col. 12 Ln. 48 - 64, Col. 14 Ln. 1 - 13).

28.   As to claim 23, Coscarella teaches the method as claimed in claim 22, wherein said identified local I/O controllers connected to the local I/O bus and said identified fabric-attached I/O controllers to the I/O manager are reported using a common set of procedures or commands (Col. 5 Ln. 53- 67).

29.   As to claim 24, Coscarella teaches a method of initializing a host to report multiple paths to a target agent via a cluster fabric comprising: enabling the local I/O bus driver to identify any local I/O controllers connected to a corresponding local I/O bus, enabling the fabric bus driver to identify any fabric-attached I/O controllers assigned to the host, identifies all paths to a target fabric-attached I/O controller, and report all multiple paths to a target fabric-attached I/O controller via the cluster fabric and directing service requests between the host and the target fabric-attached I/O controller in response to the multiple paths (figure 3A/B Col. 5 Ln. 14 - 67, figure 5 Col. 7 Ln. 24 - 67). Also see the rejection of claim 1 above.

30.   Coscarella is silent with reference to loading an operating system kernel into a memory/loading an I/O manager into the memory, loading a local I/O bus driver and a fabric bus driver providing a local I/O bus abstraction for the cluster fabric into the

memory and create one instance of an I/O controller driver stack for each path to the

target fabric-attached 1/0 controller.

31.   Chow teaches loading an operating system kernel into a memory/loading an I/O

manager into the memory, loading a local I/O bus driver and a fabric bus driver

providing a local I/O bus abstraction for the cluster fabric into the memory and create

one instance of an I/O controller driver stack for each path to the target fabric-attached

1/0 controller ("...cs..." Col. 6 Ln. 38 - 49, Col. 9 Ln. 10 - 18, Col. 12 Ln. 48 - 64, Col. 14

Ln. 1 - 13).

32.   As to claims 25 and 29, see the rejection of claim 22 above.

33.   As to claim 26, see the rejection of claim 23 above.

34.   As to claims 27,28 and 30, see the rejection of claims 6,7 and 8 respectively.

35.   Claims 3, 9-13 and 16 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Pat. No. 5,644,712 to Coscarella et al. in view of U.S. Pat.

No. 6,341,356 B1 to Johnson et al. as applied to claim 2 above, and further in view

of U.S. Pat. No. 6,209,023 B1 to Dimitroff et al.

36.   As to claim 3, Coscarella and Johnson are silent with reference to the host as claimed in claim 2, wherein said fabric bus driver presents the cluster fabric to the kernel as a local I/O bus, and presents one or more target fabric-attached 1/0 controllers to the kernel as local I/O controllers.

37.   Dimitroff teaches the host as claimed in claim 2, wherein said fabric bus driver presents the cluster fabric to the kernel as a local 1/0 bus, and presents one or more target fabric-attached 1/0 controllers to the kernel as loca I/O controllers (figure 1 Col. 5 Ln. 18 - 67, Col. 6 Ln. 1 - 37).

46. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Dimitroff, Johnson and Coscarella because teaching of Dimitrof would improve the throughput of system of Johnson and Coscarella by facilitating disk drive access.

38.   As to claim 9, Coscarella teaches an-operating system for a host coupled to a cluster fabric including one or more fabric attached I/O controllers, comprising: a kernel, one or more I/O controller drivers operatively coupled to the kernel (figure 1 Col. 1 Ln. 21 - 67), a fabric bus driver operatively coupled to the I/O manager to provide an I/O bus abstraction to the I/O manager to report multiple paths to a target fabric-attached I/O controller and the operating system to direct service requests between the host and the target fabric-attached I/O controller in response to the multiple paths (figures 1 and 3A/B Col. 5 Ln. 14 - 67, Col. 6 Ln. 1 - 49, figure 5 Col. 7 Ln. 24 - 63).

39.   Coscarella is silent with reference to one or more fabric-attached I/O controllers
that may be allocated or assigned to different hosts and one or more I/O controller
drivers operatively coupled to the kernel, each controller driver specific for a specific
type of I/O controller.

40.   Johnson teaches one or more fabric-attached I/O controllers that may be
allocated or assigned to different hosts (Col. 2 Ln. 26 – 43).

41.   Dimitroff teaches one or more I/O controller drivers operatively coupled to the
kernel, each controller driver specific for a specific type of I/O controller (figure 1 Col. 5
Ln. 18 - 67, Col. 6 Ln. 1 - 55).

42.   As to claim 10, Coscarella as modified is silent with reference to the operating
system as claimed in claim 9, wherein said fabric bus driver appears to the I/O manager
as a local I/O bus driver.

43.   Dimitroff teaches the operating system as claimed in claim 9, wherein said fabric
bus driver appears to the I/O manager as a local I/O bus driver (figure 1 Col. 5 Ln. 18 -
52).

44.   As to claim 11, see the rejection of claim 10 above.

45.   As to claim 12, see the rejection of claim 9 above.

46. As to claim 13, Dimitroff teaches the operating system as claimed in claim 12, wherein said local I/O bus drivers and said fabric bus driver communicate with the I/O manager using a common set of procedures (Col. 5 Ln. 53 - 67).

47. As to claim 16, Coscarella teaches the cluster as claimed in claim 14, further comprising a host-fabric adapter provided to interface the host to the cluster fabric figure 1 Col. 1 Ln. 21 - 67).

58. Coscarella and Johnson are silent with reference to a fabric adapter device driver provided to control operation of the host-fabric adapter.

59. Dimitroff teaches a fabric adapter device driver provided to control operation of the host-fabric adapter (figure 1 Col. 5 Ln. 18 - 67).

Response to Arguments

48. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E Anya whose telephone number is (571) 272-3757. The examiner can normally be reached on M-F (8:30-6:00) First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, An Meng-Ai can be reached on (571) 272-3756. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Charles E Anya
Examiner
Art Unit 2126

cea.

SUE LAO
PRIMARY EXAMINER